Earth Science Data and Information System Project

Coherent Web for EOSDIS (Phase 2)

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1 Requirements

Scope of Work – Phase II

The following sections describe the activities and deliverables for Phase II, delineated by Milestones.

1.1 Phase II - Milestone 1

1.1.1 Earthdata Internal Site

Some content owners have documents or tools made available through their existing websites that are not appropriate for public consumption or usage. These items are typically protected by a username/password security system. The Phase I EarthData site did not have the concept of "internal" documents or tools that have associated authorization. An initial structure shall be developed for the purposes of hosting restricted content and facilitating access to restricted tools. Where appropriate, tools should be converted to utilize NAMS authentication and or authorization, though it will not necessarily be the responsibility of the Coherent Web team to perform such integration.

The following section outlines specific "internal" capabilities that will be implemented for Milestone 1. Additional "internal" capabilities will be implemented for Milestone 2.

2.1.1.1 Calendar, Wiki & Document Management

The ESDIS project and other EOSDIS teams utilize separate technical solutions to provide calendaring, wiki, and document management capabilities. In Phase II, a consolidated calendaring, wiki, and document management capability shall be developed and integrated with the Earthdata internal site. The technical requirements for this solution will be gathered during Phase II and coordinated with ESDIS. The new capability will require authorization via the NAMS/IDMAX system, but also have a publically viewable component (i.e. internal vs. external in section 2.1.1 overview).

Similar to the existing content migration effort for website content into the Earthdata site, it is expected that once a technical solution has been implemented, each of the EOSDIS projects will migrate their content into the new calendar, wiki, and document management area. The Coherent Web team will work with the ESDIS project to migrate its content as a part of Phase II scope. The remaining content migration for other EOSDIS teams will be performed as a part of operations and maintenance activities.

1.1.2 Data & Service Discovery

The EOSDIS community has a number of methods whereby users may discover data and/or related services. It is a long-term goal of the Earthdata site to provide a consolidated way to discover these means and the actual data and services themselves. A number of "first-steps" can be made as a part of Milestone 1. The following sections outline specific discovery capabilities that will be implemented during this first milestone.

1.1.2.1 ECHO Data Catalog

The ECHO website currently has a semi-dynamic data catalog which is generated nightly. The catalog allows users to view a listing of collections based on 6 filtered views (data center, platform, instrument, sensor, science keyword, and campaign). After discovering a dataset, users may then perform a search for granules in Reverb. The contents of this catalog are created nightly by an automated script. This catalog is not currently planned for transition to the EarthData site as a part of Phase I, leaving it as a loss of functionality.

ECHO is currently developing a new REST API within the Multi-Format (EED Task 2 Rev 2) task. Through methods exposed by this API, the EarthData site could dynamically determine all possible values for the 6 filter areas mentioned, and display matching collections on-demand as users selected items of interest. The ECHO REST API will be available for testing in early August 2011 and Operational by midAugust 2011, allowing for enough time to integrate and deploy changes to the EarthData website. The ECHO data catalog does, however, utilize pre-harvested definitions from GCMD for campaign, data center, platform, and instrument filtering. It would be possible to pull these definitions on-demand from GCMD as requested by a user.

For Phase II- Milestone 1 a dynamic data catalog shall be developed for the EarthData website and made available within the ECHO portion of the Earthdata site. It is not the initial intention for the data catalog to be promoted to end users, but as a means whereby project personnel and targeted users can reference ECHO's dataset holdings. Datasets discovered through the dynamic catalog would be filtered by five categories, which are archive center, campaign, platform, instrument, and science keyword (topic). Definitions will be dynamically pulled from GCMD as requested by a user.

1.1.2.2 Integrate GCMD EOSDIS Portal

As an initial step to expose EOSDIS data discovery to end-users, the EOSDIS GCMD Portal (http://gcmd.gsfc.nasa.gov/KeywordSearch/Home.do?Portal=daacs&MetadataType=O) shall be integrated with the Earthdata site. Integration details will be resolved during the development activities with the GCMD team. At a minimum, the GCMD portal shall be included as a "frame" within the Earthdata site.

1.1.2.3 Dynamic EOSDIS Service Registry

In Phase I, a survey was sent to each data center to identify existing services being made available for end-users. This content shall be hosted in the new EarthData website and require manual updates to the web content when information changes. In Phase II, these services shall be registered in the ECHO Service Registry and dynamically displayed in the EarthData website.

The ECHO Service Registry contains the name, URI, description, interface, and associated datasets for each service. It would be possible to add additional fields, such as status, if necessary within the timeframe of Phase II. Using the ECHO REST API, the EarthData website would generate an on-the-fly view of services for users to browse. EOSDIS data centers would be able to make modifications to these services in the ECHO registry for use both in Reverb and the EarthData site.

1.1.2.4 Labs Integration w / ESDIS Technology Infusion Projects

The labs section of the EOSDIS website will contain information about featured Technology Infusion projects. In itself, labs is just a section of the site. Any integration of Technology Infusion projects will be handled individually and be linked to directly from, or included within, the labs section. Two technical infusion projects will be integrated into the Earthdata Labs section within Milestone 1. These projects may come from the following list, though other projects may be considered.

- **L2 Subsetter (PO.DAAC)** - The L2 subsetter is part of the PO.DAAC website. The goal will be to link directly to the tool with an EOSDIS "wrapper" continuing the branding of the home site. It will be necessary to work with PO.DAAC to figure out the cleanest way to present the functionality.

- **NSIDC & SEDAC WMS** - NSIDC & SEDAC provides a number of mapping servers that could be integrated into the Earthdata website for end user discovery * use.

• **OpenLayers SDK/WMS Capability** - Integration of an Open Layers development area will be considered. End users would be able to develop applications utilizing the OpenLayers environment and would be able to utilize existing EOSDIS WMS services.

• **Simple Subset Wizard (GES DISC)** - The Simple Subset Wizard (SSW) is a simplified, uniform interface for requesting Earth science data subsets from EOSDIS data centers. The user interface for the SSW is a javascript library built upon Openlayers and the Yahoo! User Interface Library (YUI2). To embed a version of the SSW in the EOSDIS website would require some changes to the site structure and adjustments to the CSS.

1.1.3 UI Enhancements

The User interface of the EOSDIS website is constantly evolving. In Phase Two, there will be a continuing focus to improve the user experience with an emphasis on areas that were not able to be developed when the site launched.

1.1.3.1 Mobile Device Support

Providing users with a seamless experience across a broad variety of devices is a goal for the EOSDIS website. The current user experience is acceptable on smartphones and tablet devices, but it can be improved.

There will be three types of preferred devices: iPads, iPhones and Android devices. Changes made to improve the experience on these platforms will have a similar effect on other smartphones and tablet devices. To accommodate older devices a mobile-friendly navigation can be utilized and non-supported content will not be shown.

1.1.3.2 Additional Interactive Graphics

Phase I of the EarthData website included generation of specific static images, as included in the statement of work. In Phase II, 5 interactive graphics (Le. flash) shall be developed for release to the EarthData website. These interactive graphics may come from the following list. However, additional ideas may be discussed during Phase II and chosen for inclusion.

1. Interactive Data Workflow - An interactive display of how data is processed from satellite to user (e.g. Satellite, SIPS, DMC, ECHO, Reverb, User).

2. Interactive Data Center Map - An interactive display of the United States showing where each Data Center is located and providing information/images for each DAAC.

3. EOSDIS Science Interfaces and Documentation (http://esdis.eosdis.nasa.gov/dsdocs/interface_enlarged_img.html) - An interactive display of interfaces between each EOSDIS system component.

4. EOSDIS Mission Timeline - An interactive image highlighting the missions that feed the EOSDIS data along with the feeds that are part of each mission.

5. 24 EOS Measurements (http://esdis.eosdis.nasa.gov/about/24eos.html) - An interactive display of the “EOS Measurements". This will include interaction with ESDIS do identify any modifications that will be needed.

2.1.4 Content Discovery Enhancements

The Earthdata site will continually benefit from advanced capabilities helping users discover content

that is relevant to their area of interest. The following sections outline specific content discovery enhancements that will be implemented during this first milestone.

2.1.4.1 Improved Cross-Site Content Searching

Phase I of the EarthData website will facilitate a basic text search of the EarthData site and EOSDIS data center sites. Performing a basic search across all of the data center sites presents the following limitations:

1. Non-EOSDIS Results - Due to the fact that many data centers have separate funding sources, some content on their website will not be associated with EOSDIS data. A simple text search through the site will result in discovering this non-EOSDIS content.

2. Unordered Results - The results to the simple text search will not be ordered by relevancy to the user's search terms. Users will be responsible for sorting through results to find relevant content.

3. Irrelevant Results - Separate from the concept of ordering results based on relevancy, the simple search may be searching data center website content that is not appropriate for text based searching.

In Phase II, the contractor shall implement an advanced web search capability, still targeted at information discovery, not data discovery. This capability will merge the results from the user's keyword search and present the results in a unified format with minimal duplication and with NASA/EOSDIS related content given higher display priority than non-NASA related content. Content for searching will be from EOSDIS related web sites (Earth Data, Data Centers, GCMD, Earth Science @ HQ, etc…). In addition, it shall provide the ability for the users to sort and filter the results through a variety of methods including site name or content type (document/web page/etc.).

2.1.4.2 Content Syndication (Prototype)

A content "Producer" and content "Consumer" concept shall be implemented, where EOSDIS can be both a Producer and a Consumer, and each DAAC can also be both a Producer and a Consumer of content and use EOSDIS content or share content with EOSDIS or with other DAACs. The long-term goal is to have a network of producers and consumers within the EOSDIS community. In Phase II, we propose that a pilot program be initiated to develop and integrate the EarthData website and at least one pilot EOSDIS data center. The targeted "pilot" EOSDIS data center will be identified in cooperation with ESDIS.

1.1.5 Milestone 1 Deliverable Summary

- The following additional capabilities integrated into the EarthData website
    - A consolidated calendaring, wiki, and document management capability
    - A dynamic data catalog for the EarthData website to be made available within the ECHO portion of the site using the ECHO REST API
    - An EOSDIS GCMD Portal
    - An ECHO Service Registry to be dynamically displayed
    - Integration of two technical infusion projects into the Labs section of the site
    - Improved support for mobile devices with a focus on iPads, iPhones and Android devices
    - Five interactive graphics
    - An advanced web search capability that will
        - o merge the results from the user’s keyword search
        - o present the results in a unified format
        - o give higher display priority to NASA/EOSDIS related content than non-NASA related

content
    - provide users sort and filter capabilities
- A prototype integration of the site with at least one pilot EOSDIS data center

1.2 Phase II - Milestone 2

2.2.1 Earthdata Internal Site

The following sections describe the additional internal site capabilities that will be implemented for Milestone 2.

2.2.1.1 Ticket Tracking Tool

During Phase I, an interim bug tracking solution was chosen to track change requests to the EarthData website. In Phase II, an official internal EarthData tracking solution shall be implemented and integrated with NAMS. The following requirements will be considered when designating a ticket tracking tool:

- The ticket tracker's user authentication must be able to integrate with NAMS, meaning only "internal" users will have access to the application.
- The individuals submitting trouble tickets include:
    - Coherent Web Team
    - ESDIS
    - Content Owners
- The individuals needing visibility into submitted tickets are the same as those with permissions to submit tickets.
- End-user feedback from the EarthData website will not be directly integrated with the ticket tracking system.

2.2.2.1 User Support Tool

Upon launch, the Phase I Coherent Web Team shall act as the de-facto user support staff answering user questions. Over time, this role will transition to a more appropriate and long-term support team. It is proposed that a User Support Tool be chosen and deployed to facilitate support activities such as responding to user feedback, providing an FAQ or knowledge base, and connecting science-based questions to the appropriate Data Center. Feedback management activities would be available to authorized internal personnel. The following requirements will be considered when designating a user support tool.

- The support tool's user authentication must be able to integrate with NAMS, meaning only "internal" users will have access to the application.
- An Earthdata support email address will be connected directly to the support tool.
- A customer portal facilitating feedback entry and knowledge base review is desired.
    - If available, the customer portal should be "stylable" to match the Earthdata site.
- End-user feedback from will not be directly integrated with the ticket tracking tool.

2.2.2 Refined Content Publication Workflow

Building upon the pilot program from milestone 1, the content publication workflow will be further developed and implemented. Lessons learned from the program will be communicated with other Data Centers and requirements will be adjusted if necessary. Once all requirements are established, a schedule will be proposed in partnership with the Data Centers followed by larger-scale implementation of this part of the portal concept.

1.2.3 Integration of lance.nasa.gov Site & Tools

Phase I of the EarthData website did not include integrating LANCE content or user registration. The user registration component of LANCE will be addressed separately. However, in Phase II, the informational content of the LANCE website shall be transitioned into the EarthData website. Some details regarding this transition include:

- The LANCE Home Page data spotlights will be integrated with the main EarthData information.
- News feed integrated into EarthData CMS and shown on main page.
- Access links to LANCE NRT ftp sites will continue to take users out of the LANCE/Earth Data site.
- At least same functionality as will exist prior to integration.
- Improved UI for LANCE Rapid Response WMS.
- Integration of State of the Earth (SOTE) viewer - currently GoogleEarth Plugin.

Due to its complexity, the LANCE "Image Browser" (http://lance.nasa.gov/dataproducers/modaps/modaps-image-browser/) will not be re-hosted within the EOSDIS EarthData website as a part of Phase II. Links to the Image Browser will continue to point to the existing site.

1.2.4 Datacasting Feed Reader Integration

A number of EOSDIS data centers are implementing data casting feeds built in accordance with the activities of the ESIP Discovery Cluster (http://wikLesipfed.org/index.php/Discover). In order to promote the usage of these data casting feeds, the Earthdata site shall be enhanced to develop/reuse and provide linkages and examples of how data cast feed readers can be used. The feed reader would aggregate configured data casting feeds from designated EOSDIS data centers and/or ECHO. Users would then be able to review new data sets as 'casted' by these feeds.

Additional information may be provided to users regarding how to access and subscribe to the EOSDIS data casting feeds in their own readers. This informational content development shall be performed as a part of general operations and maintenance support.

1.2.5 Keyword Data Searching

In Phase II - Milestone 1, the ECHO data catalog and EOSDIS GCMD portal shall be integrated with the new Earthdata site. In order to continually improve users' ability to discover EOSDIS data, an enhanced keyword dataset discovery capability shall be developed during Phase II - Milestone 2. This enhanced keyword search capability would be similar to the new PODAAC website dataset discovery capability where keywords or pre-defined faceted data characteristics can be used to filter data sets.

1.2.6 Video Library Enhancements

The EOSDIS website will include basic ability to upload and catalog video files but to offer a true video library will require more specific requirements and development. The ability to catalog videos, offer multiple versions (for download/embedding/etc.) and to embed within related content are among the features required. Video types shall include visualizations and taped talks at conferences.

1.2.7 Milestone 2 Deliverable Summary

- A ticket tracking tool to be accessible only to appropriate users with NAMS accounts for use by ESDIS, content providers, and the Coherent Web Team
- A User Support Tool to be accessible only to appropriate users with NAMS accounts to facilitate support activities such as responding to user feedback, providing an FAQ or knowledge base, and connecting science-based questions to the appropriate Data Center

- The following additional capabilities integrated into the EarthData website
    - o An improved content publication workflow with additional Data Centers participating in the producer-consumer model
    - o Informational content from the LANCE website (the LANCE "Image Browser" will not be integrated at this time)
    - o A data cast feed reader that would aggregate configured data casting feeds from designated EOSDIS data centers and/or ECHO
    - o An enhanced keyword search capability where keywords or pre-defined faceted data characteristics can be used to filter data sets
    - o An enhanced video library capability with ability to catalog videos, offer multiple versions (for download/embedding/etc.) and to embed within related content

1.3 Phase II - Milestone 3

1.3.1 Phase III ROM Development

Just as was done for this document, time and labor shall be allocated for the Raytheon Coherent Web team to work with ESDIS to develop an Ops Concept and ROM for Phase III activities.

1.3.2 Additional Interactive Graphics

In addition to the graphics developed during Phase II- Milestone 1, three additional interactive graphics shall be developed and published to the Earthdata website by the end of Milestone 3. It is possible that one or more of these graphics will be developed during the Milestone 2 timeframe. The graphics that are to be developed will be chosen on an as-needed basis.

1.3.3 Reverb Integration w / Earthdata Site

The Reverb data and service discovery client is developed and maintained by the ECHO team. The Reverb deployment model on ECHO hardware involves monthly release updates to two or more highly available instances. Reverb is developed using modern web technologies including RubyOnRails, Javascript, and CSS styling. It is desired that a granule search capability be integrated into the Earthdata site. Reverb, the general purpose EOSDIS granule discovery tool is the prime candidate for integration into the Earthdata site. From empirical development experience, it is not desired that a new search client be developed due to the complexities of results presentation.

In Phase II- Milestone 3, the Reverb client shall be modified to support the Earthdata site look and feel. The Coherent Web and ECHO development teams would work together to integrate Earthdata CSS styling with the Reverb interface. Through a URL parameter or domain name change, Reverb would be dynamically styled to appear with its current styling, or the Earthdata styling.

1.3.4 EOSDIS URS Personalized Login

Externally visible content and tools integrated with the Earthdata site in all previous phases do not require user authentication. The EOSDIS URS is scheduled for Operational deployment in February 2012.

In Phase II - Milestone 3, the new user authentication capabilities shall be integrated into the Earthdata. The following capabilities shall be available to a user when they log into the Earthdata site using their EOSDIS user account information:

- "Welcome User *X*" text in site header
- News/Event Filtering
    - o Filter which event sources will be displayed on the main screen.

        - Flag designating whether new news sources should be automatically added or not
    - Search results can be targeted based on settings completed by user.
    - Additional features and functionality to be determined based on user feedback and surveys.

1.3.5 Data Relationship (Prototype)

Within EOSDIS data centers, there is not currently a mechanism whereby data centers can recommend related datasets to users. For instance, a user discovering a specific dataset at NSIDC may be interested to know that EOSDIS and other users suggest a dataset from LPDAAC as complementary data. There is a lot of work to determine how to make these associations and how to ensure that they are living as new data is processed and made available.

In Phase II - Milestone 3, a pilot activity shall be performed to develop a prototype data relationship capability. The initial capability will utilize metrics gathered by ECHO and EMS to determine datasets that the same user orders or downloads. A new virtual tag group capability, similar to the existing functionality used by the ECHO service registry, shall be implemented within ECHO in order to facilitate the data associations. Users will be able to manually modify relationships via ECHO and PUMP. An automated relationship update process shall also be developed to facilitate regular updated from EMS and ECHO metrics. The results of the prototype shall be exposed through a Beta release of the ECHO Reverb client, wherein search results to user dataset searches will include related datasets. The prototype effort shall also provide recommendations for how such a data relationship capability could be expanded to include additional sources. For the purposes of testing and development, the ECHO Testbed system will be made available.

1.3.6 Milestone 3 Deliverable Summary

- A ROM for Phase III activities
- The following additional capabilities integrated into the EarthData website
    - Two additional interactive graphics
    - User authentication with URS to provide the following
        - Welcome User X" text in site header
        - NeWS/Event Filtering
        - Filter which event sources will be displayed on the main screen
        - Flag designating whether new news sources should be automatically added
        - Search results targeted based on user settings
- An ECHO Reverb client updated with the EarthData website look and feel
- A prototype data relationship capability whereby data centers can recommend related data sets to users to be exposed to users via a Beta release of the ECHO Reverb client